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**POPULATION AND LABOR FORCE RESOURCES
AS FACTORS IN ECONOMIC DEVELOPMENT**

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POPULATION AND LABOR FORCE RESOURCES AS FACTORS IN ECONOMIC DEVELOPMENT

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1. Economic development has as its objective the raising of the level of living of a people. The population of a nation, however, not only reaps the gains of economic development through increased per capita income but, as the human resource, also plays a vital role in its achievement. In the contemporary situation, four aspects of population in the less developed areas are operating to retard economic development. These are the relatively high rate of population growth, unfavorable age structure, unbalanced population distribution, and inadequately educated and trained manpower. All of these obstructions to economic development are amenable to control. But they cannot be controlled unless the ways in which they hamper efforts to raise levels of living are fully understood, relevant policies are formulated, and necessary programs put into operation. The relation between each of these population factors and economic development is briefly discussed in the materials which follow.

2. High Rates of Population Growth. The standard of living cannot be raised unless aggregate output increases more rapidly than total population. This relationship is shown in the following over-simplified equation: $L = \frac{O}{P}$, where "L" equals levels of living, "O" equals aggregate output and "P" equals population. It is clear from this equation that an increase in aggregate output does not result in any increase in level of living if, simultaneously, there is a corresponding increase in total population. The greater the rate of population increase, then, the higher must be the rate of economic growth to effect any increase in per capita income.

3. The implications of this equation may be readily seen in examining the population and income data for the world, as a whole, and for its continental regions. During the second half of this century, according to the United Nations "medium" population projections, world population will increase about $2\frac{1}{2}$ fold to reach a total of 6.3 billion by the year 2000. (Table 1). Drawing also on the United Nations data for aggregate income for the world and its regions (Table 2) the interrelationships between population increase and income increase may be observed. For example, considering the world as a whole, aggregate income between 1950 and 2000, must be increased 4-fold to match the 1950 per capita income of Europe, and by 12-fold to match the 1950 per capita income of North America. A decrease in world population growth to 0.5 percent per year, the rate actually experienced between 1800 and 1850, would diminish the task of raising the aggregate product of goods and services by some 75 to 80 percent.

4. A similar analysis is possible by regions. Latin America, whose population is projected by the UN to increase more than $3\frac{1}{2}$ -fold during the second half of the century, would have to increase her aggregate product 8-fold to match the 1950 European level of living by the year 2000, and 23-fold to match the 1950 North American level of living. Africa, which may increase her population some $2\frac{1}{2}$ -fold during the second half of this century, would require a 13-fold increase in continental income to match the 1950 European level of living by the end of the century, and something like a 38-fold to match the North American level of living. Finally, Asia, which according to the United Nations projections may experience a population increase during the second half of this century as great as the population of the

entire world in 1950, an increase of some 2.5 billion, would have to increase her aggregate income by a factor of 21 to match the 1950 European level of living by the year 2000, and by a factor of 62 to match the 1950 North American level of living by the same date.^{2/} Calculations of this type, over-simplified as they may be, nevertheless demonstrate that contemporary and projected rates of population increase in the economically less developed areas impose stupendous burdens upon them in their efforts to raise their living levels. Yet, ironically enough, there is an inverse relationship between the level of living of a region and its current and projected rate of population increase to the end of the century. (Compare Tables 1 and 2)

5. Rapid population growth also adversely affects investment to achieve economic growth. To effect an increase in output, investment increments must be great enough to produce income increments adequate to raise per capita income. Capital-income ratios indicate that to achieve an increment of one unit of income approximately three units of capital are required.^{3/} Populations increasing at a rate of 3 percent per year, already approximated by Latin America and other parts of the world and in prospect for most of the less developed areas in this century, must therefore achieve a savings of approximately 9 percent per annum, merely to maintain their present low levels of per capita income. Yet many of the economically less developed societies find it difficult to achieve a savings rate of more than 4 to 5 percent. It is doubtful that India, even with her prodigious efforts towards economic development, has as yet achieved a savings rate in excess of 10 percent. Thus, even with outside capital, she has been barely able to keep ahead of her 2 percent per annum increase in population.^{4/} This is why India has so much increased her effort to control population growth as an important factor in planning economic development.

6. Rapid population increase, however, is not necessarily a barrier to economic development. There can be little doubt that in the history of the present economically advanced nations rapid population growth may actually have contributed to increased product per head and to higher levels of living. But the man-resources ratio in the present economically advanced nations was, on the whole, much more favorable at their initial stages of economic growth than is true of the less developed areas today. In North America during the 19th century, for example, a resource-rich unexploited continent, rapid population increase undoubtedly contributed to increased levels of living. For with its low man-resources ratio, rapid population growth contributed to economies of scale. In the less developed areas today where there is already a high man-resources ratio rapid population growth contributes not to economies of scale but to diminishing returns.^{5/}

7. Finally, it may be observed that rapid population increase serves as a barrier to economic development not only in the manner indicated above but, also, in the way it may contribute to an unfavorable age structure, to excessive urbanization, and to retardation of effective investment in human resources.

8. Unfavorable Age Structure. High fertility areas have larger proportions of young persons than do low fertility areas. (Table 3) In Asia, Latin America and Africa in 1950, 40 percent or more of the total population was under 15 years of age. In contrast, in Europe and in North America, 26 and 27 percent of the total population, respectively, were under 15 years of age. By 1975, according to the United Nations "medium" projections, the age structures of the economically less developed, as compared with the economically advanced areas of the world, will not have appreciably changed. Because of their anticipated higher fertility rates they will still have larger proportions of their total population under 15 years of age.

9. The relatively large proportions of persons under 15 years of age in the high fertility, less developed regions of the world, may be interpreted as "unfavorable" to economic development for at least two reasons. First, the relatively high proportion of young persons below working age tends to reduce labor input per capita and, all other things being equal, tends therefore to reduce income per capita. Second, the larger proportion of young persons in the population requires that a greater part of limited resources be allocated to "social" investment rather than to

"economic" investment. That is, the more youthful the population the greater is the proportion of total savings that must be devoted to the rearing of the young, and the smaller is the proportion of total savings that is available for investment in agricultural or industrial projects designed to increase per capita production.

10. The adverse effects on economic development of the age structure of a high fertility society may be readily documented. Changes in age structure are the result of changes in fertility and mortality. Reductions in the death rate occur first of all and disproportionately among infants and youth. In consequence, reduced mortality tends to increase greatly the proportions of young persons in a population. On the contrary, reductions in the birth rate tend to decrease the proportion of young persons in a population. Over time, a population ages more rapidly by reason of a reduced birth rate than as the result of a decreased death rate.^{6/} The effect of reductions in fertility and mortality on the proportion of workers in a population and on "needs" per worker resulting from changes in age structure are presented in Table 4.

11. It may be observed that as mortality decreases, while fertility remains constant, there is a decrease in the proportion of "active" males, that is workers, in a population. For example, if the gross reproduction rate remains at a level of 3.0, the number of active males per 1000 population decreases from 286 when expectation of life at birth is 30 years, to 257 when expectation of life reaches 70 years, a decrease of 10 percent in the proportion of workers in a population. In contrast, as the birth rate declines while the death rate remains constant, an increase in the proportion of workers takes place. Thus, when expectation of life at birth is 30 years, a decline in reproduction rate from a level of 4.0 to 2.0 results in an increase in active males per 1000 population from 255 to 328, an increase of almost 30 percent. The joint effect of decreasing mortality and increasing fertility may also be measured. A death rate that has decreased to achieve an expectation of life of 50 years from a level of 30 years while the gross reproduction rate declines from 4.0 to 2.0, effects an increase in active males per 1000 population from 255 to 315, an increase of almost 25 percent.

12. Since many of the less developed areas of the world are in the process of achieving an increase in expectation of life at birth from approximately 30 years to 50 years, the entries under these two levels of expectation of life in Table 4 point to what may be the actual experience of such areas if reductions in fertility are effected.

13. The "needs" of a population are to some extent a function of its age structure; that is, consumption varies with age, for both children and elderly people have different needs from those of adults of intermediate age. The United Nations has estimated the changes in the needs of a population with changing age structure, expressing the needs of an adult as unity, 1.0, and the needs of a child or an aged person by 0.7 of a unit. The changing needs per 1000 active males in the population under the impact of changing fertility and mortality are shown in the lower panel of Table 4.

14. It is readily seen that as the death rate declines and expectation of life at birth increases, needs per 1000 active males increase. Thus, with a gross reproduction rate of 4.0, needs per 1000 active males would rise from 3,323 units to 3,672 units as expectation of life increases from 30 years to 70 years, an increase of over 10 percent. Contrariwise, a decrease in the birth rate while mortality remains constant has the effect of decreasing needs per 1000 active males. Thus, if expectation of life remains fixed at 30 years a decline in the gross reproduction rate from 4.0 to 2.0 would reduce needs per 1000 active males from 3,323 units to 2,699 units, or by almost a fifth. The joint effect of decreasing fertility and mortality may also be traced. Thus, if a gross reproduction rate declines from 4.0 to 2.0 while expectation of life increases from 30 years to 50 years, needs per 1000 active males decline from 3,323 units to 2,766 units, a decrease of about 17 percent. A decrease in the birth rate brings about a decrease in the needs of a population per 1000

workers as the net effect of an increase in the proportion of workers and of a decrease in young persons below working age.

15. The decline in the proportion of young persons contributes to economic development in still another significant way. For the smaller the proportion of persons below working age, the smaller is the proportion of total savings that must be allocated to the rearing of the young, and the greater is the proportion of total savings that may be allocated to productive investment. Hence, a decrease in the proportion of persons below working age simultaneously decreases the dependency burdens of workers and increases the proportion of total savings which may be placed in productive channels.

16. High fertility, then, under conditions of declining mortality, has the effect of retarding economic development not only in being responsible for high rates of total population growth but, also, in producing an age structure which adversely affects economic growth.

17. Imbalance in Population Distribution. High urbanization generally is identified with economically advanced areas and the advent of industrialization. Yet despite their relatively low rate of urbanization, the less advanced areas in Asia, Latin America and Africa, because they have such a vast total population, have more people living in cities of 20,000 or more, or cities of 100,000 or more, than do the economically advanced nations of Europe and North America combined. In 1950, Asia, Latin America and Africa, contained over 45 percent of the world's residents of cities of 20,000 or more; whereas, Europe (excluding the USSR) and North America contained but 41 percent of the world population living in cities of this size. (See Table 5) Moreover, during the 20th century the rate of urbanization of Asia, Latin America and Africa has exceeded that of Europe and North America.

18. The degree of urbanization has quite different implications for economic development in the advanced than in the less developed areas. In the economically advanced nations, urbanization is both an antecedent and a consequent of high levels of living. It makes possible and advances the division of labor and specialization, the application of non-human energy to production, improved technology, economies of scale, external economies, minimization of the frictions of space and communication, and, in general, higher per capita income. In the economically less developed areas, however, urbanization tends to be the product of quite different factors and is not accompanied by corresponding increases in productivity and levels of living. In the less developed areas of the world today, urbanization is less the result of indigenous economic development and more the product of economic development of an historical imperial system focused largely on a "mother" country. Urban agglomerations in the less developed areas are more the product of the push of population from over-populated rural areas than the pull of population to urban centers by reason of greater economic opportunity. Furthermore, the recent acceleration in the rate of urbanization in many of the less developed areas reflects the disruption and disorganization produced by the war and post-war political instability creating a troubled countryside and large refugee populations. By reason of the above considerations, the less developed areas of the world may be said to be "over-urbanized" in the sense that larger proportions of their population live in urban places than is justified by their degree of economic development. More specifically, compared with the economically advanced nations at comparable levels of urbanization, a much smaller proportion of the labor force in the less developed areas is engaged in non-agricultural and especially mechanized industrial occupations.

19. In consequence, the relatively large urban populations in the less developed areas serve as a barrier rather than as an accelerant to economic development. To state that a less developed area is over-urbanized is to pose its major economic problem because what is meant is that it does not have an adequate economic base to support its urban population by the standards of the economically advanced nations. Such areas are faced with the problem of achieving higher levels of economic development to support their present, let alone their prospective urban populations. The

accelerating rates of urbanization which confront the less developed areas are likely to worsen rather than to ameliorate their poverty and distress. Asia, for example, is faced with the prospect of tripling her urban population in the quarter of a century between 1950 and 1975, assuming the population increase that is projected by the United Nations and the continuation of her 20th century rate of urbanization;^{8/} and the prospects for Latin America and Africa are approximately the same. The fundamental economic problem of the less developed areas is that of achieving increased productivity. The many difficulties which obstruct the attainment of this objective are likely to be exacerbated rather than ameliorated by the present and prospective rates of urbanization.

20. Given the present levels of productivity and limited savings in the less developed areas, a major common problem relates to the allocation of resources for the improvement of agriculture, on the one hand, and the development of industrial sectors of the economy, on the other. In many nations improvement in the productivity of the agricultural sector of the economy may contribute more to rising levels of living than efforts to induce industrialization. The claims of large and growing urban populations and their growing political importance may require disproportionate allocations of limited resources to the development of the urban, rather than the agricultural, sectors of the economy, at the expense of a net increase in product per head.

21. The achievement of adequate balance between agricultural and urban industrial development is complicated by difficult problems of dividing limited savings between "social" and "productive" investment. This problem, although it is manifest both in the urban and in the rural sectors, finds its most acute form in the city. Urban areas in the less developed nations are characterized by inadequate infra-structure development which precludes the usual amenities of urban existence found in advanced nations. There is a great need and much temptation to allocate resources to social purposes such as the elimination of shanty towns, piped water, sewerage, better housing and social services for in-migrants. Social investment of this type, badly needed as it may be, can be made only at the expense of decreased investment in agricultural and industrial productive facilities--investment designed to increase productivity as in tractors and fertilizers or in power plants, factories and transport.

22. The already acute problems of the urban areas in the less developed areas, social and political, as well as economic, are intensified by the large internal migratory flows of population from rural to urban areas. This fact has been recognized by a number of nations which are making efforts to decelerate rural to urban migration by means of programs designed to raise levels of living of the rural population. It may well be that the quickest way to increase the levels of living of urban population may lie in agrarian reforms, including modification of outmoded land tenure systems, which would give the agricultural population a stake in the land, produce higher productivity, and induce the rural population to remain in rural areas.

23. Imbalance in the distribution of population between urban and rural areas, considered in relation to industrial and general economic development, may, then, operate to retard economic growth. Needless to say, such a maldistribution of population is worsened by excessively high rates of total population increase. The dampening of total population growth rates would undoubtedly bring about a sharp decline in the rate of urbanization and make a more balanced population distribution possible.

24. Quality of Human Resources. The three aspects of population which tend to retard economic development discussed above are each concerned with problems of quantity of population --total population, an unfavorable age structure, and imbalance in urban-rural distribution. Also operating as a barrier to economic development, is the low quality of population in the less developed areas, that is, the low general educational level and low skill of the population and most importantly of the labor force. High levels of illiteracy and the absence of a skilled labor force serve as major barriers to economic growth, particularly in the urban and industrial sectors of the economy.

25. It is becoming recognized that perhaps the most important single type of investment for achieving economic development is investment in human resources. In fact it is being argued that "investment in the human factor may well have a higher payoff in terms of increased output than does any other input."^{9/} Moreover, evidence is mounting that only a relatively small share of increased output is the result of increases in the conventionally regarded inputs of labor, land and capital combined. For example, recent studies suggest that for the period 1899-1953 in the United States, only a third of increased output may be accounted for by increased input of labor, land and capital. The remaining two-thirds of the increase in output seems to be the result of the combination of technology, organization and human capital together with all other factors.¹⁰ Moreover, the data suggest that of these latter four types of input, human capital may be the most important. Investment in human resources is essentially investment in the improved quality of population, as it may be achieved through increased education and training.

26. There is little need for elaborating the importance of increasing the level of education of a population as an important element in achieving economic development. A major barrier to raising the educational level of a nation, however, may be found in high fertility. This can be readily demonstrated. (Table 6) It is apparent that as mortality decreases while the birth rate remains fixed, total school construction needs may increase from a doubling to more than a quadrupling. Thus, with a gross reproduction rate of 3.0 an increase in expectation of life from 30 years to 70 years, would result in a $2\frac{1}{2}$ fold increase in school construction needs, an increase from 10 units to 25 units. Contrariwise, a decrease in birth rate produces a substantial decrease in school construction needs when mortality is held constant. Thus, for an expectation of life of 50 years, a decrease of more than two-thirds is effected in school construction needs when the gross reproduction rate declines from 4.0 to 2.0. That is, annual school construction needs declines from 29 to 8 units. If the birth rate is decreased along with declines in the death rate, appreciable decreases in school construction needs may be effected. For example, if the gross reproduction rate is decreased from 4.0 to 2.0 while expectation of life increases from 30 to 50 years, school construction needs are decreased by more than 50 percent -- from 19 to 8 units.

27. The gains that may be achieved from a reduction in birth rate in decreasing the investment necessary for educational construction may, of course, also be gained in decreasing the investment necessary for increasing teachers and educational facilities. Similar savings may be achieved on training programs, that is, the teaching of occupational skills.

28. Concluding Observations. Economic development policies and programs must take into account the role of population factors, in general, and specifically the four aspects of population which have been discussed above. To eliminate the adverse effects of population factors on economic development it is necessary to dampen rates of total population increase, to effect a more favorable age structure, to achieve a more balanced urban-rural population distribution, and to raise the quality of the population by attaining higher levels of education and training. Each of these goals is attainable, and, significantly enough, all may be achieved by the same means -- namely, through a decrease in the birth rate.

29. In the contemporary world situation, given the great declines in mortality achieved and in prospect, a decrease in the birth rate would simultaneously reduce rates of population increase, favorably alter the age structure, help to effect better balance between urban and rural population distribution, and permit more adequate and effective investment in human resources.

30. A decrease in birth rate seems a simple enough solution. But it is not easy of attainment. The hard fact is that in most of the less developed areas there is

neither incentive nor motivation for regulating family size. Moreover, it is not clear that the techniques for controlling fertility are as yet available which can be effectively employed in these areas. In the contemporary world there are no economically advanced nations which do not employ both death control and birth control. But, there is no guarantee that the methods that have proved to be effective in the economically advanced areas will automatically prove to be effective in the less developed areas.

31. There is a great need, therefore, for increased research both in the social sciences and in the natural sciences. Social science research is needed to learn more about how to increase motivation and incentive for the regulation of the family size. Natural science research is needed to learn more about human reproduction so that more effective methods for controlling fertility may be developed. Programs for the development and application of science and technology for the benefit of the less developed areas must necessarily embrace these needs.

FOOTNOTES

1. For fuller discussion of relation of population growth to economic development see: United Nations, The Determinants and Consequences of Population Trends, United Nations, New York, 1953, especially Part III, pp. 181-288; Lewis, W. Arthur, The Theory of Economic Growth, Richard D. Irwin, Inc., Homewood, Illinois, 1955, Chapter VI, especially pp. 304-330; Kuznets, Simon, "Quantitative Aspects of the Economic Growth of Nations: I, Levels and Variability of Rates of Growth," Economic Development and Cultural Change, V, 1, October, 1956, 5-94; Coale, Ansley J. and Hoover, Edgar M., Population Growth and Economic Development in Low Income Countries, Princeton, N. J., Princeton University Press, 1958, especially Part Four.
2. Hauser, Philip M., Population Perspectives, Rutgers University Press, New Brunswick, New Jersey, 1960, pp. 16-20.
3. United Nations, op. cit., pp. 277 ff. Also Ward, Barbara, The Rich Nations and The Poor Nations, W. W. Norton and Company, Inc., New York, 1962, p. 91. Kuznets, Simon, "Quantitative Aspects of the Economic Growth of Nations: V, Capital Formation Proportions: International Comparisons for Recent Years," loc. cit., VIII, 4, Part II, July 1960, pp. 1-96; and "VI, Long Term Trends in Capital Formation Proportions," loc. cit., IX, 4, Part II, July 1961, pp. 3-124.
4. Ward, Barbara, op. cit., p. 92.
5. Lewis, W. Arthur, op. cit., pp. 323 ff.; also FEP, World Population and Resources, Political and Economic Planning, London, 1955, pp. 90 ff. and also Part II, Chapter 4.
6. United Nations, The Aging of Populations and Its Economic and Social Implications, United Nations, New York, 1956, Chapter II.
7. The materials in paragraphs 17 to 23 are drawn largely from proceedings of UNESCO/United Nations seminars on urbanization and United Nations Seminar on Regional Planning published as follows:
Hauser, Philip M. (ed.), Urbanization in Asia and the Far East, UNESCO, Calcutta, 1957
Hauser, Philip M. (ed.), Urbanization in Latin America, UNESCO, Belgium, 1961.
United Nations, United Nations Seminar on Regional Planning, United Nations, New York.
8. Hauser, Philip M., "Implications of Population Trends for Regional and Urban Planning in Asia and the Far East." Regional Planning: Housing, Building and Planning, Numbers 12 and 13, United Nations, New York, 1960, pp. 21-31.
9. Frank, Andrew Gunder, "Human Capital and Economic Growth," Economic Development and Cultural Change, VIII, 2, Jan. 1960, p. 170
10. Ibid, pp. 170 ff.

Table 1. Estimated population and population increases, by continent, 1900 to 2000

Area	Population (million)					Av. annual increase (%) ^{a/}			
	1900	1925	1950	1975	2000	1900-1925	1925-1950	1950-1975	1975-2000
World	1550	1907	2497	3828	6267	0.9	1.2	2.1	2.6
Africa	120	147	199	303	517	0.9	1.4	2.1	2.8
Northern America	81	126	168	240	312	2.2	1.3	1.7	1.2
Latin America	63	99	163	303	592	2.3	2.6	3.4	3.8
Asia	857	1020	1380	2210	3870	0.8	1.4	2.4	3.0
Europe (including U.S.S.R.)	423	505	574	751	947	0.8	0.6	1.2	1.0
Oceania	6	10	13	21	29	2.3	1.4	2.4	1.6

^{a/} Arithmetic mean of percentage of increase for 25-year periods.

Source: The Future Growth of World Population, United Nations, New York, 1958

Table 2. Population and income, by continent, about 1950

Area	Total population		Aggregate income		Per capita income (\$)
	No. (thousands)	(%)	Dollars ^{a/} (millions)	(%)	
World	2497	100.0	556	100.0	223
Africa	199	8.0	15	2.7	75
North America	219	8.8	241	43.3	1100
South America	112	4.5	19	3.4	170
Asia	1380	55.3	69	12.4	50
Europe (exclusive of U.S.S.R.)	393	15.7	149	26.8	380
U.S.S.R.	181	7.2	56	10.1	310
Oceania	13	0.5	7	1.3	560

^{a/} The calculations were made by using United Nations per capita income figures for each continent applied to revised United Nations estimates of 1950 population of continents to obtain revised aggregate income by continent and for the world. A new world per capita figure of \$223 was obtained, as compared with the published figure of \$230.

Source: "National and Per Capita Income of 70 Countries in 1949," U.N. Statist. Papers, Ser. E. No. 1, United Nations, New York, 1950

Table 3. Estimated Age Composition of the Population of the World and Continents, 1950 and 1975

Continent	1950			1975		
	Under 15	15 - 59	60 & Over	Under 15	15 - 59	60 & Over
World	37	56	7	38	54	8
Africa	42	54	4	41	54	5
Northern America	27	61	12	28	56	16
Latin America	40	54	6	42	52	6
Asia	40	55	5	41	54	5
Europe	26	62	12	24	59	17
Oceania	30	59	11	31	55	14
U.S.S.R.	33	59	8	30	59	11

Source: United Nations, The Future Growth of World Population, United Nations, New York, 1958, p. 35

Table 4. Estimated Active Males Per 1000 Population and Estimated Needs per 1000 Active Males at different levels of Expectation of Life at Birth and of Gross Reproduction Rate

(Activity Rates in Underdeveloped Countries) a/

Gross Population Rate	Expectation of Life at Birth		
	30 years	50 years	70 years
Active Males per 1000 Population			
4.0	255	240	226
3.0	286	271	257
2.0	328	315	301
1.0	392	382	369
Needsb/ per 1000 active males			
4.0	3,323	3,489	3,672
3.0	3,016	3,146	3,288
2.0	2,699	2,766	2,870
1.0	2,283	2,309	2,373

a/ For effects assuming developed countries activity rates, see source.

b/ Needs of 1 adult = 1.0.

Source: U.N. Population Studies, No. 26, The Aging of Populations and Its Economic and Social Implications, United Nations, New York, 1956, p. 62.

Table 5. Distribution of Urban Population of the World, By Continents, 1950

Continent	Total population %	Population living in cities of 20,000 and more %	Population living in cities of 100,000 and more %
World	100	100	100
Asia	53.2	33.8	33.7
Europe	16.4	27.5	26.5
North America	6.8	13.9	15.2
U.S.S.R.	8.1	12.0	11.2
South America	4.6	5.8	6.5
Africa	8.2	3.7	3.2
Central America	2.1	2.1	2.0
Oceania	0.5	1.2	1.6

Source: Philip M. Hauser (ed.), Urbanization in Asia and the Far East, UNESCO, Calcutta, 1957, p. 99

Table 6 Estimate of Total Annual School Construction Needs a/ per 1000 Active Males at Different Mortality and Fertility Levels

(Activity Rates in Underdeveloped Countries) b/

Gross Reproduction Rate	Expectation of Life at Birth		
	30 years	50 years	70 years
4.0	19	29	38
3.0	10	19	25
2.0	3 c/	8	13

a/ Construction required for one male pupil = 1.0

b/ "It has been assumed that, between the ages of 10 and 24, school attendance rates were equal to the difference between the male activity rates and 1 in the five-year age groups and that all children of from 5 to 9 years of age attended school."

c/ The difference between the rate of replacement needs (2.9 per 1,000) and the rate of vacancies occurring.

Source: U.N. Population Studies, No. 26, The Aging of Populations and Its Economic and Social Implications, United Nations, New York, 1956, p. 69

